

(PROFORMA FOR SUBMISSION OF ANNUAL PROGRESS REPORT OF RESEARCH PROJECTS)

PART-I : GENERAL INFORMATION

- 600 Project Code
- 6001 Institute Project Code No. : GGB-1.10
- 6002 ICAR Project Code No.
- 6003 Name of the Institute and Division : Central Institute for Research on goats, Makhdoom.
Division of Goat Genetics & Breeding
- 6011 Name and address of Instt. : Central Institute for Research on goats, Makhdoom,
P.O. Farah-281122, Mathura (U.P.)
- 6012 Name of Division/Section : Division of Goat Genetics & Breeding
- 6013 Location of the project : Central Institute for Research on goats, Makhdoom
- 602 Project title : Genetic Improvement of Barbari Goats for
Meat and Milk Production
- 603 Priority area :
- 6031 Research Approach : Applied Res./Basic Res./Process/Transfer of or Tech.
Or Tech. Develop.
- | | 01 | 02 | 03 | 04 |
|--|----|----|----|--|
| 604 Specific area | | | | : Production of elite bucks. |
| 605 Duration of project | | | | : Long term Initiated in 1993 |
| 6051 Date of start of project | | | | : 1993 |
| 6052 Likely date of completion of project: | | | | Continuation up to first year of 11 th Five Year
Plan. |
| 6053 Period for which report submitted | | | | : 2008-09 |
| 606 Total cost of the project | | | | : As per AICRP on Goat Improvement Barbari
Unit |
| 6061 Expenditure to date | | | | : |
| 607 Summary Achievements | | | | : Enclosed |

608 Key Words : Barbari, Selection, bucks. Genetic trends,
Breeding Value. Heritability

PART-II : INVESTIGATOR PROFILE

(Please identify clearly changes, if any in project personnel)

610 Principal Investigator :
6101 Name : Dr. S.K. Singh
6102 Designation : Principal Scientist
6103 Division/Section : Division of Goat Genetics & Breeding
6104 Location : C.I.R.G., Makhdoom
6105 Institute address : Central Institute for Research on Goats,
Makhdoom,
P.O. Farah-281122, Mathura, U.P.

611 Co-investigator :
6111 Name : Dr. P.K. Rout
6112 Designation : Senior Scientist
6113 Division/Section : Division of Goat Genetics & Breeding
6114 Location : C.I.R.G., Makhdoom.
6115 Institute address : Central Institute for Research on Goats,
Makhdoom,
P.O. Farah-281122, Mathura, U.P.

612 Co-investigator :
6121 Name :
6122 Designation :
6123 Division/Section :
6124 Location :
6125 Institute address :

613 Co-investigator :
6131 Name : -
6132 Designation : -
6133 Division/Section : Division of Goat Genetics & Breeding
6134 Location : C.I.R.G., Makhdoom.
6135 Institute address : Central Institute for Research on Goats,
Makhdoom,

P.O. Farah-281122, Mathura, U.P.

6223 Process/Product/Technology/Developed during the year.

6224 Utility of results obtained so far : Information obtained are useful in selection of
Breeding bucks and deciding breeding policy.

623 Publications and Material Development :
(One copy each to be supplied with this proforma).

6231 Research papers : One + three published

6232 Popular articles : -

6233 Reports : -

6234 Seminars and workshops (relevant to the project) in which the Scientists have
participated.

1 Infrastructural facilities developed: (1) Renovation of Sheds, water facility, Feeders
etc.

PART-III : TECHNICAL DETAILS

- 620 Introduction and objectives : **Enclosed**
- 6201 Immediate objectives :
- 6202 Long term objectives :
- 6203 Specific objectives : Sire evaluation/improvement in production potential.
- 621 Project Technical profile :
- 6211 Technical programme : **Enclosed**
- (Indicate briefly plan of procedure, techniques, instruments and special materials, organisms, Special environment etc.)
- 1 Progress of work : **As per objectives**
- 6221 Achievements in terms of targets fixed for each activity : Target achieved.
- 6222 Questions – Answered

PART-IV : PROJECT EXPENDITURE

(Summary)

Year :

630 Recurring Expenditure

6301 Salaries : (Designation with pay scale)

- i) Scientific
 - ii) Technical
 - iii) Supporting
 - iv) Wages
-

Sub Total

6302 i) Consumables

- i) Chemicals
 - ii) Glasswares
 - iii) Others
-

Sub Total

6303 Travel

3604 Miscellaneous
(other costs)

6305

Sub Total (Recurring)

631 Non-Recurring Expenditure (Equipments)

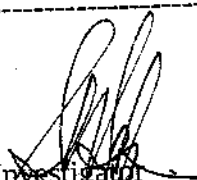
- i)

ii)

iii)

632 Total :
(630 & 631)

Signature of the Project Investigator



Co-investigators

1.

5/6/09 (S.K. SenGupta)

2.



(S.K. SenGupta)
Dr. P.K. Rant is on deputation

3.

Progress is as per technical programme.
6/6/09

Signature & Comments of the
Joint Director (Research)

Signature & Comments of the Director

ANNUAL REPORT 2008-09 (AICRP ON GOAT IMPROVEMENT (BARBARI))

Project No. : GGB 1.10 , Genetic Improvement of Barbari Goats for Meat and Milk Production (Barbari Goat Unit)

Project Leader: Dr. S. K.Singh, Principal Scientist, AG&B.

Project Associates: Dr. P.K.Rout, Senior Scientist, AG&B

Objectives:

- 1.To estimate genetic variance of economic traits in goats.
- 2.To estimate breeding value of males and females.
- 3.In-situ/ex-situ conservation of elite germplasm and its effective utilization.
- 4.To estimate production economics of goats under farm conditions.
- 5.To validate farm based goat production technologies under field conditions.

Technical Programme:

- 1.Each unit will maintain 200-300 breedable does and 10 bucks under semi-intensive system of management.
- 2.Selection of males and females will be made on the basis of 6 months body weight in small breeds (Black Bengal) and 9 months body weight in medium and large breeds.
- 3.Selected of females will also be done on the basis of age and weight at first kidding.
- 4.Important production data like body weight at different age group (3,6,9 and 12 months), milk yield, kidding weight, age and weight at first kidding to be recorded.
- 5.Culling will be done on the basis of selection criteria adopted for selection of the does.
- 6.Feedlot studies will be conducted by the nutrition component worker for estimating FCE and carcass characteristics in 10 males upto 6, 9 & 12 months of age.
- 7.Disease pattern and control measures will be undertaken by the goat health component worker.
- 8.Selected superior sires will be maintained as the elite germplasm and 500 doses of semen of each elite buck will be stored in the Semen Bank by the reproduction component worker.
- 9.Superior sires will be distributed for improving the production of goats in the farmers' flocks. Semen of all the bucks will be tested for quality before use for breeding.
10. Selection differential for body weight to be estimated.
11. Economics of goat rearing will be analysed in collaboration with NCAP, Delhi.

RESUME OF WORK

Genetic improvement programme for meat and milk in Barbari (Fig 1) goats continued during the financial year 2008-09. On 1st April, 2008, 835 Barbari goats were available under breed improvement programme. Out of this 339 were adult females and 75 were bucks. Approximately, 50 genetically superior, does and bucks each, were selected for grading up, conservation and genetic improvement of farmers flock which were sold at later part of the next financial year. In all 506 kids born at the farm during the year wherein 257 were males. Two hundred forty seven genetically superior goats were sold for breeding programme to various private and government agencies for conservation and genetic improvement. Overall mortality was 7.5% which was within the acceptable norms. For experimental purposes 104 goats were spared to various department of the Institute. At the end of the financial year 2008-09, 727 goats were available. The strength of adult male and female were as per technical requirement of the project. The population growth was 126%.



Figure 1: Barbari Does in shed

Data on adult body weight for birth, 3, 6, 9 and 12 months of age were analysed using least square method (LSMLMW/PC2 version). The fixed effects included in the analysis were year and season of birth, sex of kids and type of birth while weight of dam at kidding were taken as linear regression. The overall least squares mean for body weight at birth, 3, 6, 9 and 12 months of ages were 1.79 ± 0.01 , 7.63 ± 0.05 , 12.06 ± 0.07 , 16.42 ± 0.10 and 20.23 ± 0.15 kg respectively. The respective body weight during 2008-09 were lower than that of previous years (Figure 2). This might be due to unfavourable assignable and non assignable environment. Kids born during March-April season were 1.83 ± 0.01 , 7.74 ± 0.06 , 11.51 ± 0.09 , 15.61 ± 0.11 and 20.47 ± 0.16 kg respectively. Single born kids were significantly heavier than that of twin or triple (Table-1).

Table1: Least Squares Mean of Body Weight Growth (Kg) in Barbari Goats

Factor	Weight at				
	Birth	3M	6M	9M	12M
Overall mean	1.79 ± 0.01 (2556)	7.63 ± 0.05 (2140)	12.06 ± 0.07 (1836)	16.42 ± 0.10 (1590)	20.23 ± 0.15 (1403)
Year of birth					
2004	1.86 ± 0.01 (494)	6.85 ± 0.09 (389)	11.63 ± 0.13 (344)	17.19 ± 0.17 (319)	21.05 ± 0.19 (292)
2005	1.76 ± 0.01 (619)	8.00 ± 0.08 (531)	12.75 ± 0.12 (464)	16.23 ± 0.14 (426)	20.28 ± 0.17 (398)
2006	1.74 ± 0.01 (395)	7.76 ± 0.09 (347)	12.00 ± 0.14 (306)	17.19 ± 0.14 (282)	21.34 ± 0.20 (264)
2007	1.81 ± 0.01 (636)	8.41 ± 0.08 (567)	13.00 ± 0.11 (530)	16.43 ± 0.14 (470)	21.14 ± 0.17 (415)
2008	1.79 ± 0.01	7.13 ± 0.10	10.93 ± 0.17	15.06 ± 0.29	17.33 ± 0.54

	(412)	(306)	(192)	(093)	(034)
Season of birth					
I	1.83±0.01 (1320)	7.74±0.06 (1083)	11.51±0.09 (955)	15.61±0.11 (854)	20.47±0.16 (705)
II	1.75±0.01 (1236)	7.52±0.06 (1057)	12.60±0.10 (881)	17.22±0.13 (736)	19.98±0.18 (698)
Sex of kid					
Male	1.88±0.01 (1327)	8.06±0.06 (1117)	12.92±0.09 (933)	17.76±0.12 (775)	21.70±0.17 (679)
Female	1.70±0.01 (1229)	7.20±0.06 (1023)	11.19±0.09 (903)	15.07±0.12 (815)	18.76±0.16 (724)
Type of birth					
Single	2.04±0.01 (834)	8.85±0.06 (699)	12.87±0.10 (577)	17.15±0.13 (480)	20.79±0.18 (406)
Twin	1.83±0.01 (1493)	7.71±0.13 (1261)	12.18±0.07 (1102)	16.63±0.10 (971)	20.31±0.14 (868)
Triplet	1.51±0.02 (229)	6.34±0.06 (180)	11.11±0.19 (157)	15.47±0.24 (139)	19.59±0.30 (129)
**P<0.01, P<0.05					

The lactation performance of the Barbari goats for milk yield over 90, 140 days and lactation milk yield (LMY) and lactation length (LL) are shown in (Table 2). The lactational data for the period between 2004-2008 were analysed using least squares technique. Factor included in statistical model were year, season, type of kidding and parity of dams. Overall least squares mean were were 63.33±0.94, 120.79±4.61, 64.64±1.05 liters and 102.12±0.80 days. Ninety days milk yield and LMY are depicted in Figure 3 and 4. Highest mean 90 days milk yield and lactation milk yield were observed in year 2004 which were 76.41±1.40 and 77.26±1.61 liters respectively. Goats kidding during March -April season produced significantly higher milk than does kidded during October- November season. The type of kidding did not influence dam's milk yield. The order of parity did influence lactational traits significantly. Highest milk production were observed in 4th and 5th parities. The absolute selection differential for the male kids selected were 7.1 kg for 9 months of body weight and 6.2 liters for 90 days milk yield. The higher selection intensity indicates that intense selection pressure was applied for genetic selection in Barbari Goats..

Table 2: Lactation Performance of Barbari Goats

Factor	90 days milk (liters)	140 days milk (liters)	Lactation yield (liters)	Lactation length (days)
Overall mean	63.33 ±0.94 (1135)	120.79 ±4.61 (142)	64.64±1.05 (1332)	102.12±0.80 (1332)
Year of kidding				
2004	76.41±1.40 (224)	165.82±11.97 (5)	77.26±1.61 (262)	97.54±1.22 (262)
2005	70.07±1.39 (257)	120.91±4.24 (56)	72.53±1.53 (315)	105.66±1.16 (315)
2006	56.33±1.55	-	56.71±1.73	97.41±1.31

	(175)		(216)	(216)
2007	60.65±1.26 (324)	102.68±4.19 (69)	66.35±1.47 (349)	113.00±1.11 (349)
2008	53.20±1.69 (155)	93.76±7.99 (12)	51.35±1.89 (190)	96.99±1.43 (190)
Season of kidding				
Mar-Apr	70.57±1.04 (683)	-	76.22±1.19 (743)	112.40±0.90 (743)
Oct-Nov	56.10±1.15 (452)	-	53.06±1.26 (589)	91.84±0.95 (589)
Type of Kidding				
Single	66.04±0.98 (528)	116.85±4.85 (45)	67.06±1.10 (632)	102.01±0.84 (632)
Twin	64.54±0.84 (551)	115.68±4.20 (89)	66.47±0.95 (633)	103.63±0.73 (633)
Triplet	59.44±2.48 (56)	129.84±9.95 (8)	60.40±2.79 (67)	100.72±2.12 (67)
Lactation order				
1	57.99±1.43 (364)	108.09±6.82 (35)	61.31±1.62 (429)	104.31±1.23 (429)
2	63.54±1.45 (236)	122.63±7.24 (27)	65.93±1.66 (270)	104.53±1.26 (270)
3	63.34±1.55 (182)	118.56±5.73 (32)	64.90±1.75 (217)	103.58±1.32 (217)
4	65.26±1.75 (136)	126.40±7.34 (18)	65.09±1.98 (162)	100.35±1.51 (162)
5	65.73±2.06 (90)	117.69±8.10 (13)	65.98±2.31 (108)	100.34±1.75 (108)
6	64.15±1.87 (127)	131.39±7.67 (17)	64.62±2.12 (146)	99.61±1.61 (146)

Age and weight at first kidding, kidding interval, service period, gestation period has shown Table-3. Seeing the reproductive parameters it can be concluded that Barbari goats has got early sexual maturity. Therefore, related lower age at first mating and kidding this make the breed highly selection for meat production.

Table 3: Mean Reproductive Traits in Barbari Goats Over the Years

S.No	Traits	2004-05	2005-06	2006-07	2007-08	2008-09
1	Age at first mating(days)	233.8±6.0 (34)	225.9±9.2 (50)	215.1±1.6 (42)	230.4±5.6 (54)	253.2±5.6 (56)
2	Weight at first mating(kg)	15.00±0.3 (46)	16.93±0.3 (16)	15.40±0.1 (42)	19.3±0.6 (54)	20.7±0.6 (56)
3	Age at first kidding (days)	398.0±0.7 (49)	401.2±.7 (16)	371.0±4.1 (31)	358.0±6.1 (37)	397.7±4.1 (56)
4	Weight at first kidding(kg)	19.00±0.3 (41)	19.7±0.4 (16)	20.14±0.2 (41)	18.23±0.7 (37)	21.2±0.2 (56)

5	First kidding interval(days)	223.4±2.2 (8)	224.5±3.7 (50)	217.5±4.1 (27)	237.6±7.1 (25)	229.4±7.1 (34)
6	Service period(days)	226.1±0.3 (18)	232.70±2.1 (50)	221.51±4.6 (39)	224.31±5.4 (39)	215.3±5.4 (46)
7	Gestation period	142.2±0.2 (152)	141.51±0.2 (201)	142.4±0.1 (241)	143.1±0.1 (206)	144.4±0.1 (260)

The breeding efficiency on the basis of does available was 129% and does tupped was 89% during the year 2008-09. The kidding rate was 1.48. Out of 342 kidding 190 (49.8%) were single 140 (37.4%) and 12 (3.1%) triplet (Table -4.)

Table 4: Reproductive Performance in Barbari Goats

S.N.	Particulars	2003	2004	2005	2006	2007	2008
1	No. of available does for breeding (X)	273	248	275	288	298	339
2	No. of does bred (Y)	434	439	474	410	467	491
3	Tupping % ($Y \times 100 / X$)	159.0	177.0	172.4	142.4	156.7	144.8
4	Does Died /sold/ culled between breeding and kidding	43	148	60	42	147	167
5.	No. of does available during kidding of those available for breeding (A)	403	432	425	432	445	481
6	Tupped does available at kidding (B)	381	385	402	343	367	381
7	Does kidded	341	347	382	331	350	342
	Single (C)	149	173	165	161	170	190
	Twin (D)	183	132	197	156	168	140
	Triplet (E)	09	19	20	13	11	12
	Quadruplet (F)	-	-	-	01	-	-
8	No. of abortion (G)	07	15	13	24	12	03
9	No. of still birth (H)	08	08	07	10	05	06
10	Actual live birth (I)	543	494	619	516	538	506
11	Breeding efficiency/ fertility (a) On the basis of does available	127	146	143	123	115	129
	(b) On the basis of does tupped	80.0	89.5	83.0	86.0	78.6	88.9
12	Kidding (%)	142	128	153	150	126	141

	(a) On the basis of does available						
	(b) On the basis of does tugged	135	114	154	148	123	144
13	Kidding rate (liter size)	1.59	1.42	1.62	1.56	1.54	1.48

Figure 2: Body weight growth (kg) of Barbari kids during 2004-08

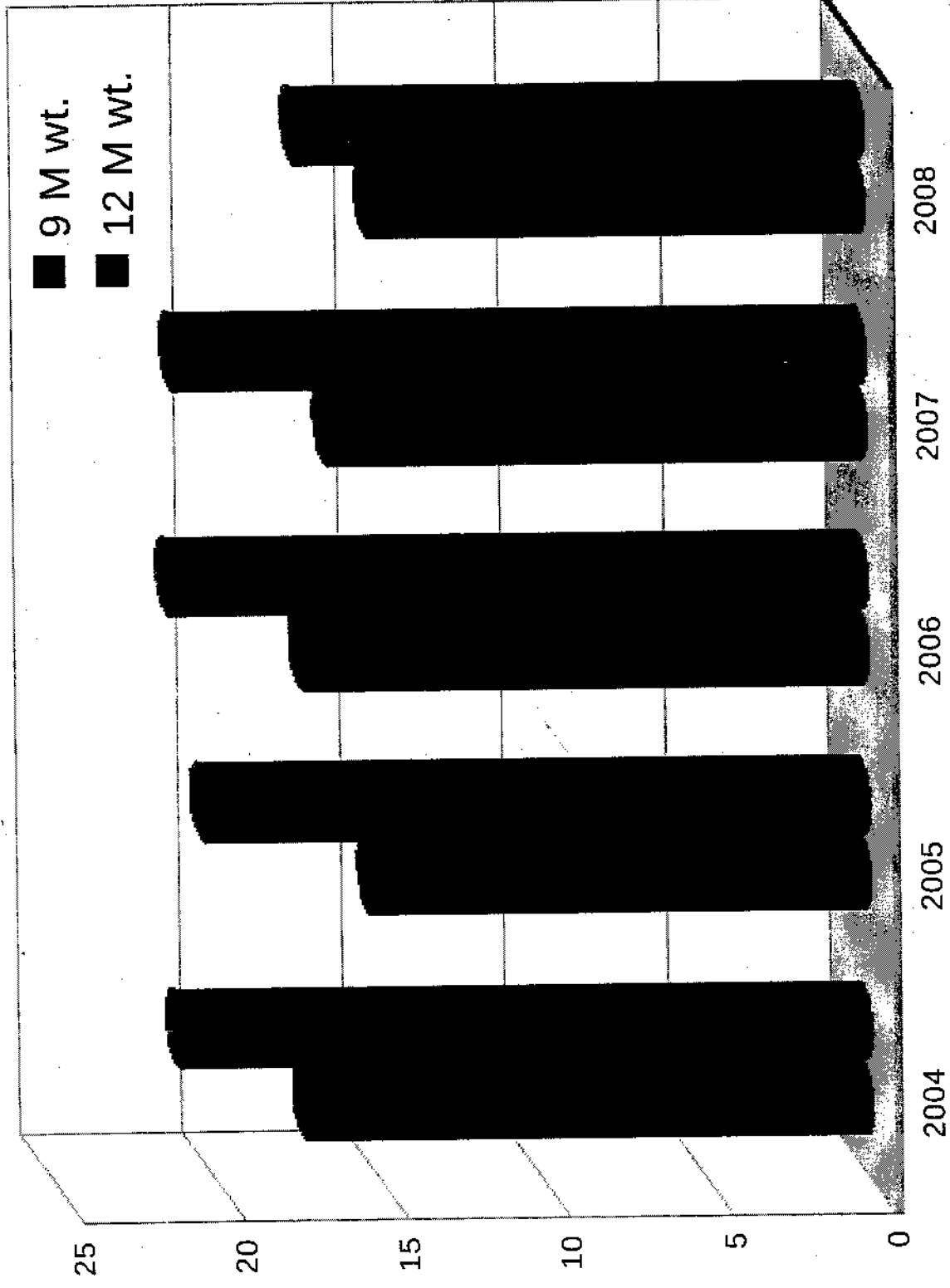


Figure 3: Ninety days Milk Yield (lit) of Barbari does during 2004-08

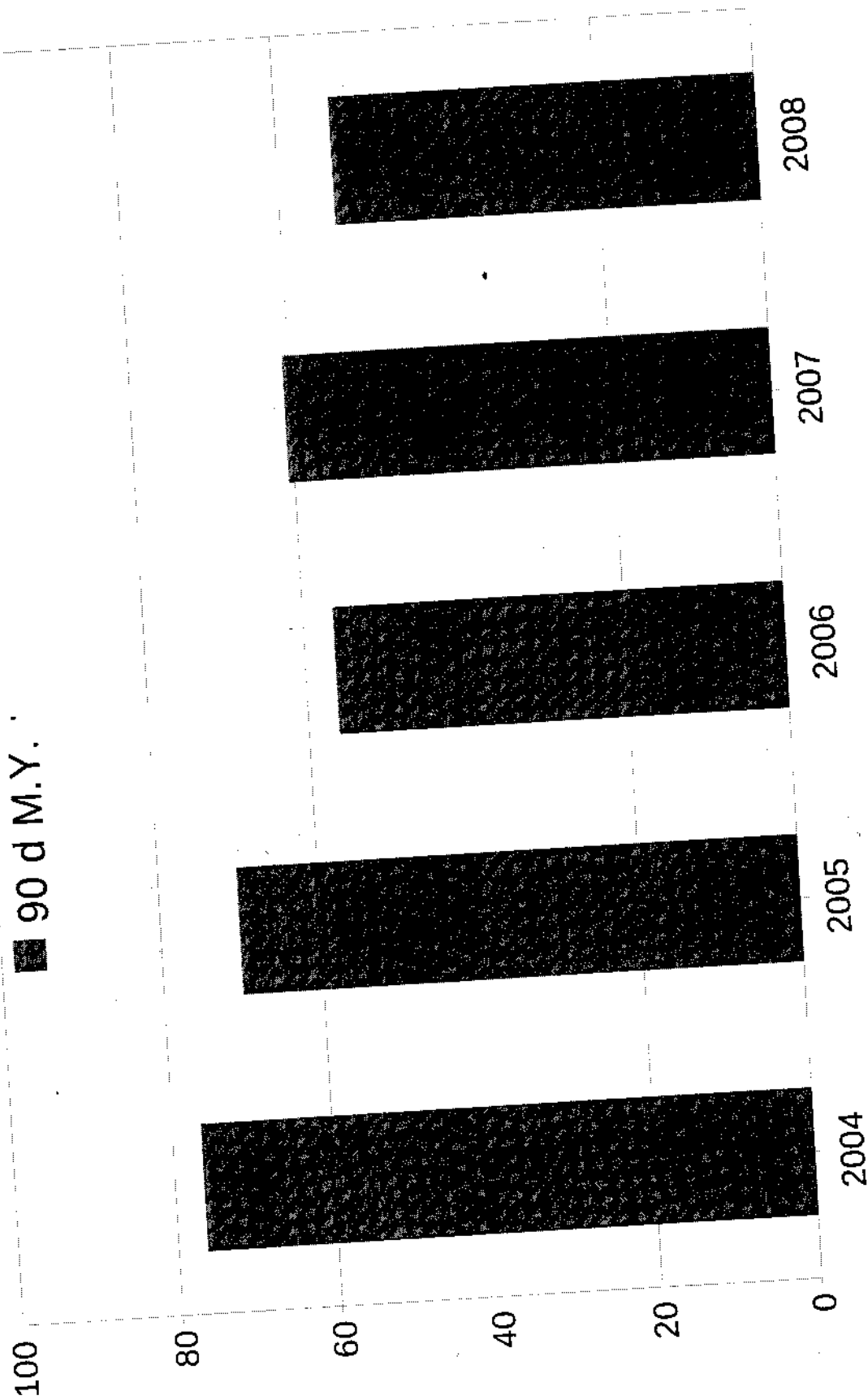


Figure 4: Total Milk Yield (lit) of Barbari does during 2004-08

